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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/849,460

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Teng-Tang Yang

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10/03/2002

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EXAMINER

YEVSIKOV, VICTOR V

ART UNIT

PAPER NUMBER

2825

DATE MAILED: 10/03/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/849,460

Applicant(s)

YANG ET AL.

Examiner

victor v yevsikov

Art Unit

2825

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 May 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10, 12-15 and 17-26 is/are rejected.
- 7) ☒ Claim(s) 11, 16 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 April 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 4, 6-10, 12-14, 17, 18 and 20-25 are rejected under 35 U.S.C. 102(b) as being anticipated by Kwon et al. (U.S. 6,004,876).

Kwon discloses a method of forming a semiconductor structure and a structure of conducting structure layer, comprising:

a substrate;

a barrier layer 102 is formed on the substrate;

a pre in-situ metal layer 106 is formed on the barrier layer; and

a first metal layer 107 is formed immediately after the pre in-situ metal layer is formed and in the same apparatus as the one in which the pre in-situ metal layer is formed; and wherein

the pre in-situ metal layer includes one of the following materials: titanium, titanium nitride, or titanium tungsten.

a step for processing the barrier layer is included at least a second metal layer.

the barrier layer includes one of the following materials: titanium, titanium nitride of titanium tungsten.

a step of depositing an anti-reflective layer on the first metal layer is also included.

the anti-reflective layer includes titanium nitride in the step of forming the anti-reflective layer.

Reference: figs. 3-5; col. 3 and 4, lines 21-49.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3, 15, 19 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kwon in view of Dixit et al. (US 6,355,558 B1).

Kwon teaches the features detailed previously but lacks a discussion on the method, wherein the first metal layer includes one of the following materials: aluminum, tungsten, copper, an alloy of aluminum and silicon, an alloy of aluminum, silicon and copper, an alloy of aluminum and copper, an aluminum alloy, an alloy of tungsten, or an alloy of copper.

However, Dixit teaches the method wherein the first metal layer includes aluminum or alloy of aluminum and copper (col. 2, lines 4-45).

Therefore, it would have been obvious to one of ordinary skill in the art to use the Al or Al-Cu alloy for metallization process in-situ in order to obtain an optimum result.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kwon in view of Tanabe et al. (US 6,323,115 B1).

Kwon teaches the features detailed previously but lacks a discussion on the method, wherein a step for processing the barrier layer includes high temperature treatment.

However, Tanabe teaches the method wherein the step for processing the barrier layer includes high temperature treatment (cols. 1-2, lines 66-17).

Therefore, it would have been obvious to one of ordinary skill in the art to use the high temperature treatment of the barrier layer in order to obtain an optimum result.

Objection

Claims 11 and 16 are objected to as being dependent upon a rejected base claims 1 and 12, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Prior art does not teach the method wherein a photolithography and an etching step is included to define the barrier layer, the pre in-situ metal layer, and the first metal layer.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Victor Yevsikov whose telephone number is (703) 3050758. The examiner can normally be reached by telephone on Monday to Friday 7:15 AM to 4:45 PM (except second Mondays).

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If attempts to reach the examiner by telephone are unsuccessful, examiner's supervisor, Matthew S. Smith, can be reached on (703) 308-1323. The fax phone numbers for the organization where this application or processing is assigned are (703) 305-3431 for regular communications and (703) 305-3431 for After Final communication.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0596.

Victor Yevsikov

September 25, 2002



MATTHEW SMITH
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800